

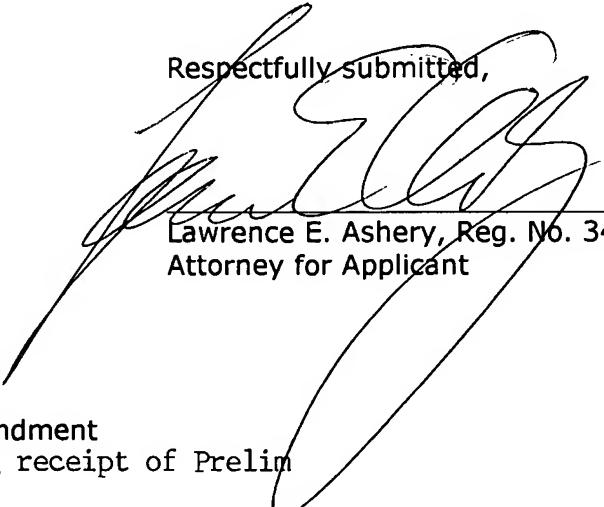
Application No.: 10/568,123  
Response Dated April 11, 2007  
Reply to Notice of January 19, 2007

MAT-8814US

**Remarks/Arguments:**

The above-referenced Official Action is directed toward claims 1-17 of the above-referenced Application, as originally filed. However, a Preliminary Amendment was filed with the Application. A copy of the Preliminary Amendment is attached to this Response. Issuance of an Official Action directed toward the claims presented in the Preliminary Amendment is respectfully and promptly requested.

Respectfully submitted,

  
Lawrence E. Ashery, Reg. No. 34,515  
Attorney for Applicant

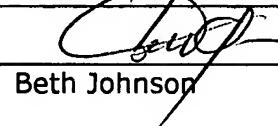
LEA/bj

Enclosure: Copy of Preliminary Amendment  
PAIR Print-out showing receipt of Prelim  
Dated: April 11, 2007

P.O. Box 980  
Valley Forge, PA 19482  
(610) 407-0700

The Director is hereby authorized to charge or credit Deposit Account No. 18-0350 for any additional fees, or any underpayment or credit for overpayment in connection herewith.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on: April 11, 2007.

  
Beth Johnson

137541

10/568,123	Brushless dc motor coupled directly to ac source and electric apparatus using the same motor	04-11-2007::14:18:21
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**Transaction History**

Date	Transaction Description
01-19-2007	Mail Non-Final Rejection
01-12-2007	Non-Final Rejection
02-14-2006	Information Disclosure Statement considered
12-11-2006	Preliminary Amendment
11-30-2006	Mail Non-Compliant Preliminary Amendment
11-30-2006	Non-Compliant Preliminary Amendment
11-30-2006	IFW TSS Processing by Tech Center Complete
11-30-2006	Case Docketed to Examiner in GAU
02-14-2006	Request for Foreign Priority (Priority Papers May Be Included)
02-14-2006	Information Disclosure Statement (IDS) Filed
02-14-2006	Preliminary Amendment
02-14-2006	371 Completion Date
05-26-2006	Application Dispatched from OIPE
05-26-2006	Notice of DO/EO Acceptance Mailed
03-05-2006	Cleared by OIPE CSR
02-14-2006	Initial Exam Team nn

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COPY



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MAT-8814US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appln. No: To be assigned  
Applicant: Masayuki TAKADA  
Filed: Herewith  
Title: BRUSHLESS DC MOTOR COUPLED DIRECTLY TO AC SOURCE AND ELECTRIC APPARATUS USING THE SAME MOTOR  
TC/A.U.:  
Examiner:  
Confirmation No.:  
Docket No.: MAT-8814US

**PRELIMINARY AMENDMENT**

COPY

Mail Stop PCT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Prior to examination, please amend the above-identified application as follows:

- Amendments to the Specification** begin on page 2 of this paper.
- Amendments to the Claims** are reflected in the listing of claims which begins on page 3 of this paper.
- Amendments to the Drawings** begin on page 6 of this paper and include an attached replacement sheet.
- Amendments to the Abstract** are on page 7 of this paper. A clean version of the Abstract is on page 9 of this paper.
- Remarks/Arguments** begin on page \_\_\_\_\_ of this paper.

**Amendments to the Specification:**

Please add the following new paragraph after the Title and before the first paragraph on page 1.

THIS APPLICATION IS A U.S. NATIONAL PHASE APPLICATION OF PCT INTERNATIONAL APPLICATION PCT/JP2004/010982 DATED JULY 26, 2004.

**Amendments to the Claims:** This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

**1.-17. (Cancelled)**

**18. (New) A brushless DC motor coupled directly to an AC source, the motor comprising:**

(a) a stator including a stator coil;

(b) a rotor including a rotor magnet;

(c) a magnetic flux sensor for sensing magnetic-flux of the rotor magnet;

(d) an inverter circuit including a plurality of switching elements coupled in a full-wave bridge having an upper arm and a lower arm;

(e) a plurality of AC source couplers;

(f) a rectifier for full-wave rectifying a voltage of the AC source;

(g) a DC voltage converter for converting a rectified voltage supplied from the rectifier into a low DC voltage, and for applying the low DC voltage to the inverter circuit as a power supply;

(h) a controller for controlling the inverter circuit based on a signal supplied from the magnetic flux sensor such that the low DC voltage is supplied to the stator coil in a full-wave driving method; and

(i) a current controller for regulating an average current value applied to the inverter circuit constantly at a set current;

(j) a set current changer for changing the set current regulated by the current controller;

wherein the set current changer changes the set current regulated by the current controller in response to which terminals of the AC source couplers are coupled to the AC source.

**19. (New) A brushless DC motor coupled directly to an AC source, the motor comprising:**

(a) a stator including a stator coil;

(b) a rotor including a rotor magnet;

(c) a magnetic flux sensor for sensing magnetic-flux of the rotor magnet;

(d) an inverter circuit including a plurality of switching elements coupled in a full-wave bridge having an upper arm and a lower arm;

(e) an AC source coupler;  
(f) a rectifier for full-wave rectifying a voltage of the AC source;  
(g) a DC voltage converter for converting a rectified voltage supplied from the rectifier into a low DC voltage, and for applying the low DC voltage to the inverter circuit as a power supply;  
(h) a controller for controlling the inverter circuit based on a signal supplied from the magnetic flux sensor such that the low DC voltage is supplied to the stator coil in a full-wave driving method;  
(i) a current instructing means for instructing the average current value for supplying to the inverter circuit;  
(j) a current controller for regulating the average current value supplied to the inverter circuit constantly at a instructed value; and  
(k) an output means for outputting a signal of a motor rpm based on a signal supplied from the magnetic flux sensor;

wherein the current instructing means instructs the average current value for supplying to the inverter circuit in response to the motor rpm.

20. (New) The brushless DC motor of claim 19, wherein the AC source coupler includes a plurality of terminals,

wherein the current instructing means changes an instruction of the average current value in response to the motor rpm depending on which terminals of the AC source coupler are coupled to the AC source.

21. (New) The brushless DC motor of claim 19, further comprising:

a detecting means for detecting a rpm range of the motor within which the motor rpm is included,

wherein the current instructing means instructs the average current value for supplying to the inverter circuit in response to the rpm range of the motor.

22. (New) The brushless DC motor of claim 18 further comprising:

a current instructing means for instructing an average current value to the inverter circuit; and

a terminal for connecting a voltage reducing means disposed outside the motor,

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wherein a signal voltage which instructs the average current value to the inverter circuit is applied to the current instructing means via the voltage reducing means disposed outside the motor and

wherein the signal voltage instructs the inverter circuit to run a constant current.

23. (New) The brushless DC motor of claim 19 further comprising:

a terminal for connecting a voltage reducing means disposed outside the motor,

wherein a signal voltage which instructs the average current value to the inverter circuit is applied to the current instructing means via the voltage reducing means disposed outside the motor and

wherein the signal voltage instructs the inverter circuit to change a current in response to the motor rpm.

24. (New) The brushless DC motor of claim 21 further comprising:

a terminal for connecting a voltage reducing means disposed outside the motor,

wherein a signal voltage which instructs the average current value to the inverter circuit is applied to the current instructing means via the voltage reducing means disposed outside the motor and

wherein the signal voltage instructs the inverter circuit to change a current in response to the rpm range of the motor.

25. (New) An electric apparatus in which the brushless DC motor as defined in claim 18 is mounted.

26. (New) An electric apparatus in which the brushless DC motor as defined in claim 19 is mounted.

**Amendments to the Drawings:**

The attached sheet of drawings includes changes to Figure 23. This sheet replaces the original sheet.

Please delete page "24/24" of the drawings, labeled as "Reference numerals in the drawings" in its entirety.

Attachment

**Amendment to the Abstract:**

The Abstract has been amended. A revised Abstract is attached.

**Amendment**

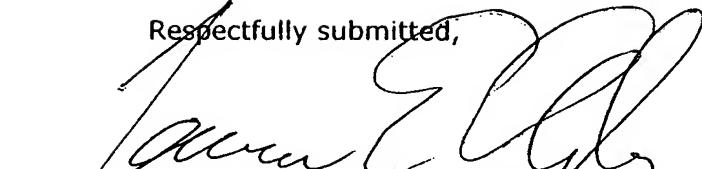
A brushless DC motor is disclosed, in which a commercial AC source is full-wave rectified by a rectifier (9) and then converted into a generally flat and low DC voltage not more than 45V by a DC voltage converter (8). The low DC voltage is applied in a full-wave driving method to a stator coil (2) via an inverter circuit (6) formed of switching elements in a bridge configuration. This structure allows obtaining the brushless DC motor coupled directly to the AC source, and the torque ripples and uneven rotation of the motor are suppressed.

**Attachment**

**Abstract**

A brushless DC motor is disclosed, in which a commercial AC source is full-wave rectified by a rectifier and then converted into a generally flat and low DC voltage not more than 45V by a DC voltage converter. The low DC voltage is applied in a full-wave driving method to a stator coil via an inverter circuit formed of switching elements in a bridge configuration. This structure allows obtaining the brushless DC motor coupled directly to the AC source, and the torque ripples and uneven rotation of the motor are suppressed.

Respectfully submitted,

  
Lawrence E. Ashery, Reg. No. 34,515  
Attorney for Applicant

LEA/bj

Attachments: Figure 23 (1 sheets)  
Abstract

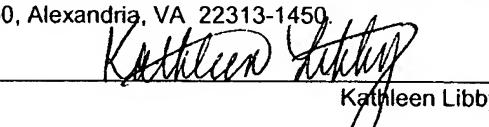
Dated: February 14, 2006

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(610) 407-0700

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**EXPRESS MAIL**      Mailing Label Number: EV 766498846 US  
                            Date of Deposit: February 14, 2006

I hereby certify that this paper and fee are being deposited, under 37 C.F.R. § 1.10 and with sufficient postage, using the "Express Mail Post Office to Addressee" service of the United States Postal Service on the date indicated above and that the deposit is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



Kathleen Libby